Can we improve restoration success in the Great Basin?

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Restoration in the Great Basin

How can we improve restoration success in the Great Basin?

Putting the pieces together

1. Reduce cheatgrass seed production and seed bank
2. Select the best seed mix
3. Seed at the optimum time, with the best technology
4. Use the best post-restoration management

1. Reduce cheatgrass seed production

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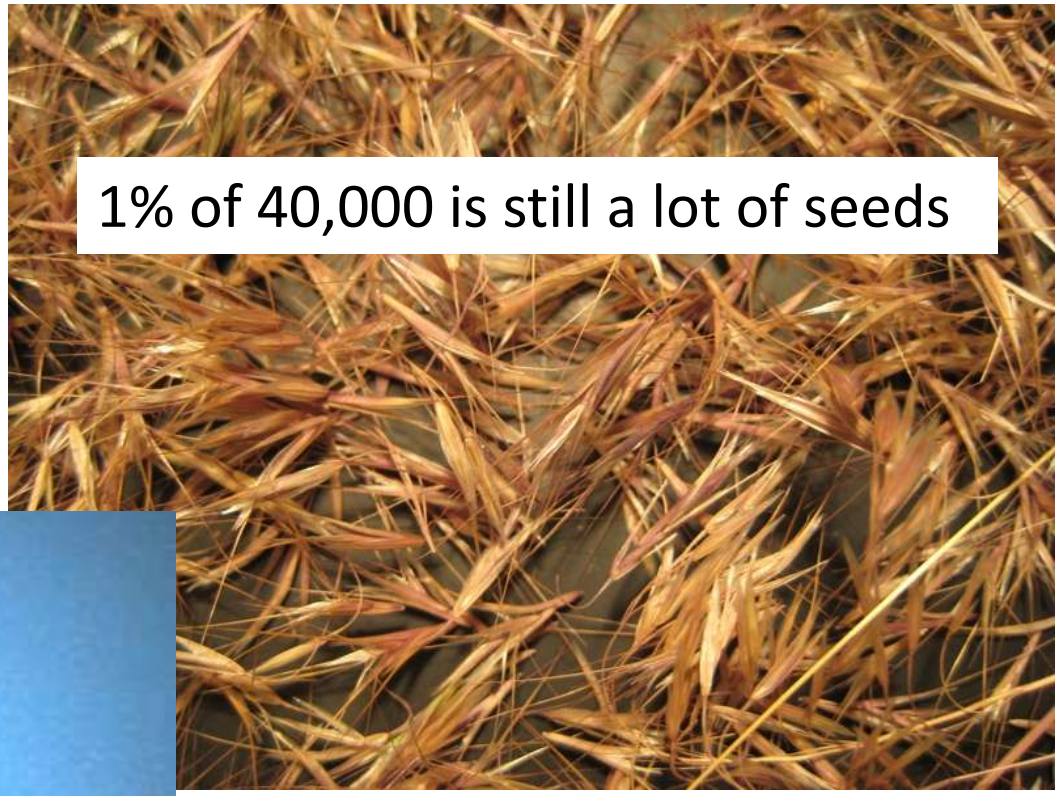
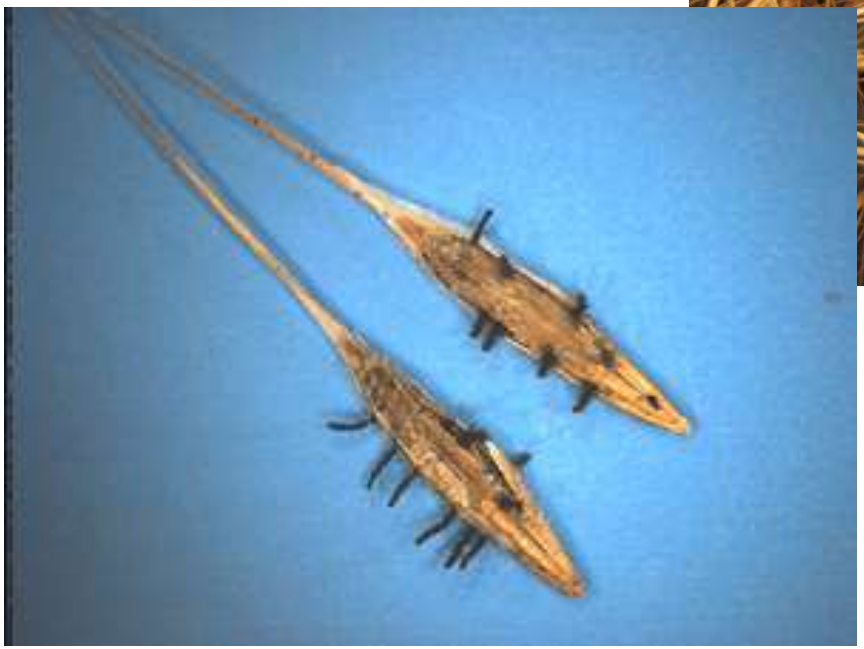
- Wild fire
- Herbicides
- Cheatgrass beer brewing
- High intensity, short duration grazing
- Biocontrol
- Take advantage of cheatgrass die-offs

2. Reduce cheatgrass seed bank

- BFOD, *Pyrenophora semeniperda*





Dr. Susan Meyer, USFS
Dr. Julie Beckstead, Gonzaga University

3. Pick the best seed mix

- Early seral species, best competitors
- Local sources
- Populations with the best suite of traits

Elymus elymoides, multisetus

Poa secunda

Amsinckia sp.

Ericameria nauseosa

Annual forbs can suppress cheatgrass

Goergen, Leger, & Forbis; *in review*

AMTE and BRTE

Where do our seeds come from?

Squirreltail

Native bluegrasses

Indian ricegrass

Bluebunch wheatgrass

Young and Larson 2005

Snake River wheatgrass

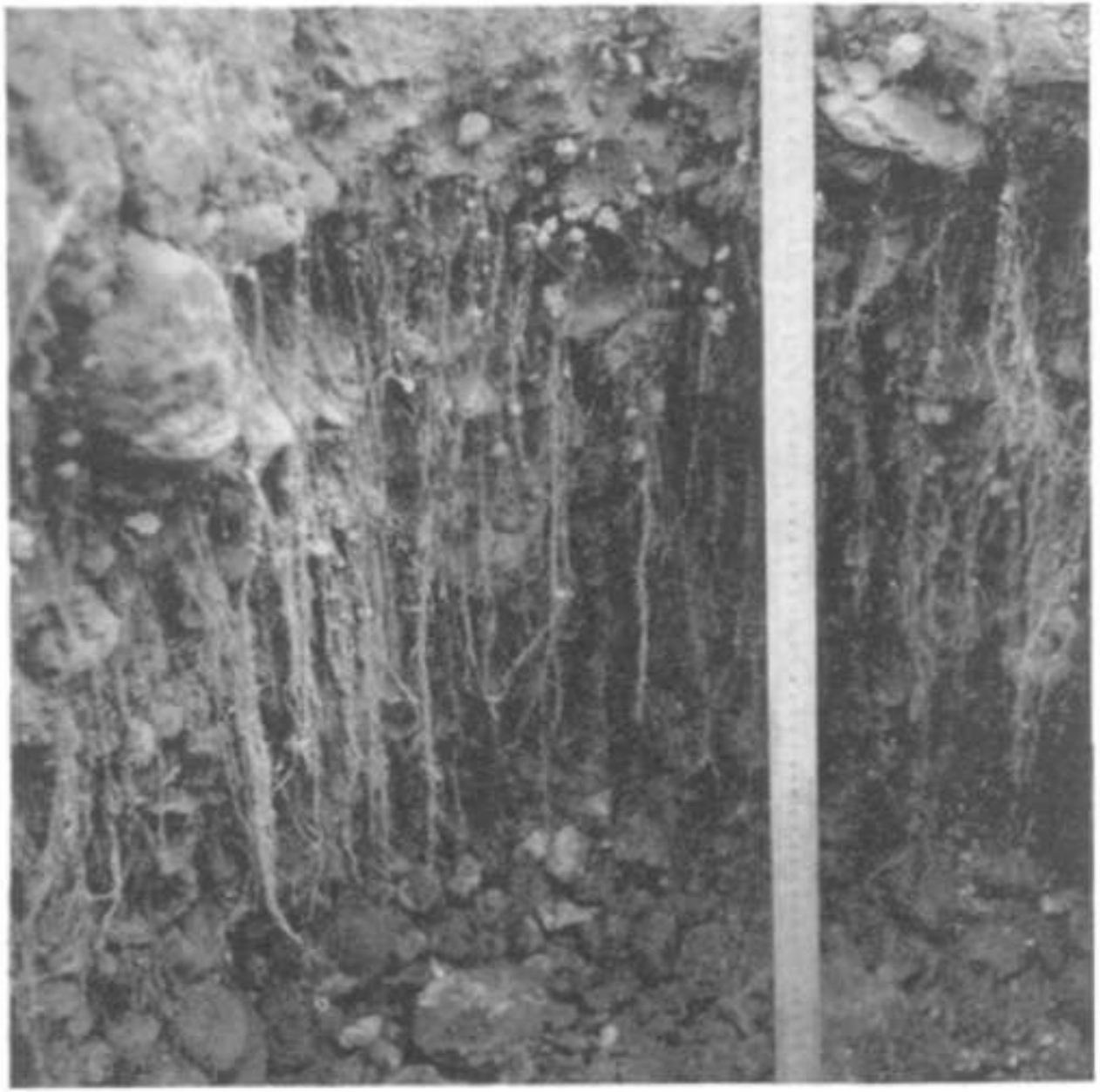
Thickspike wheatgrass

Basin wildrye

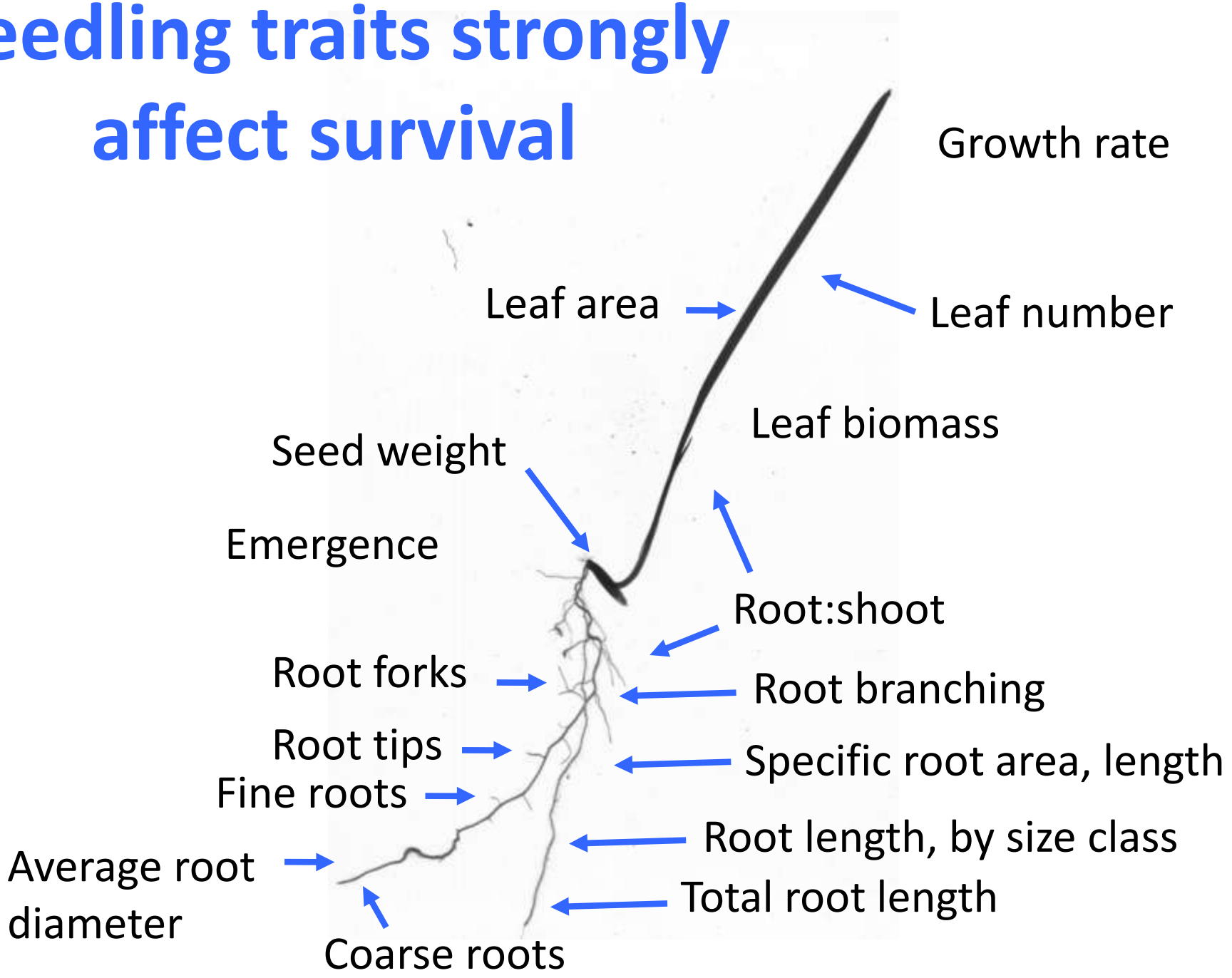
Western wheatgrass

What are good traits?

Roots...



Seedling traits strongly affect survival



What are good traits?

- Early root growth (*Elymus* seedlings)
- Root tip production (*Poa* seedlings)
- Early germination (seedlings)
- Early green-up (adults)
- Small plant size (adults, seedlings)

4. Seed with the right technology

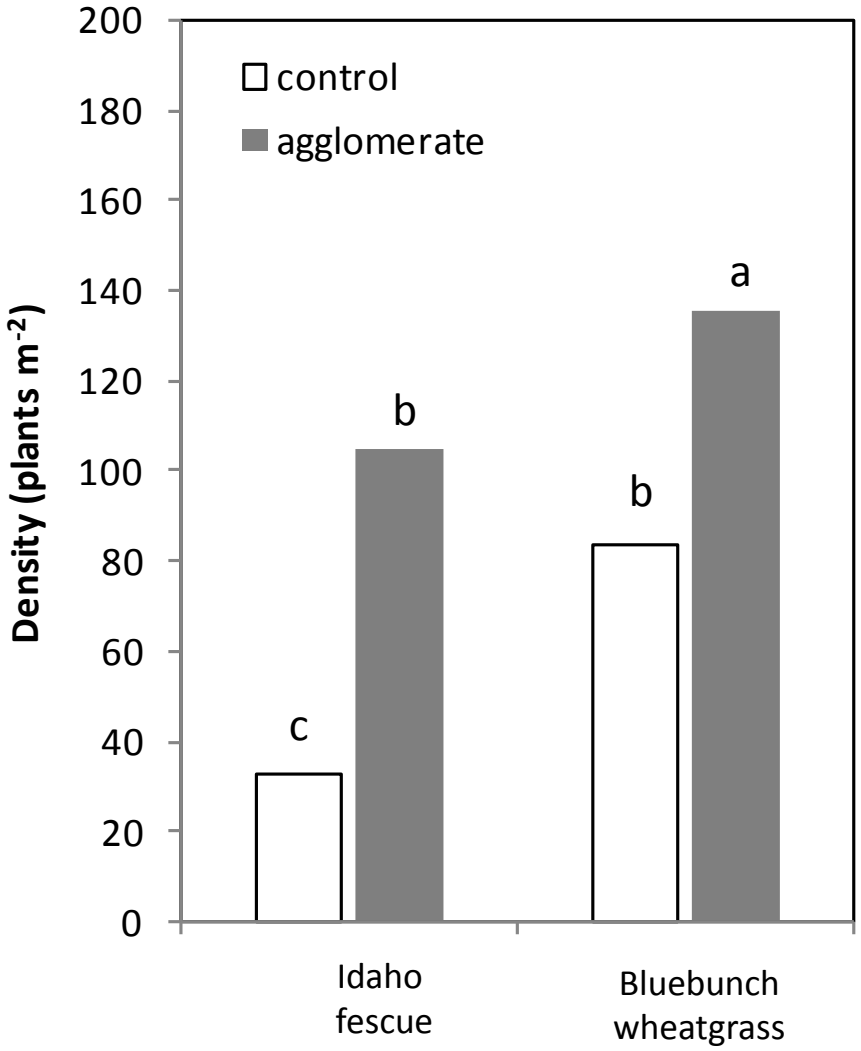
Seedlings do better with neighbors

Single seedling

Clustered seedlings

Matt Madsen, USDA ARS, Burns, OR

Higher densities of grouped seeds



Idaho fescue

single seedling

agglomeration

Bluebunch wheatgrass

single seedling

agglomeration

Matt Madsen, USDA ARS, Burns, OR

5. Best post-fire management

Can we put the pieces together?

- Will require a coordinated efforts among researchers, seed centers, managers
  - Multi-year effort, many investigators!
- May require changes in management practices
  - More expensive, but maybe more effective
  - Seed smaller areas, seeding without fires